

REMARKS

This paper responds to the Office Action dated October 6, 2004. Attached please find Form PTO/SB/30 and Form PTO-2038.

The Examiner has rejected all claims as supposedly rendered obvious over a two-way combination of a US Pat. No. 5,581,753 to Terry et al. ("Terry") and a US Pat. No. 6,557,111 to Theimer et al. ("Theimer").

Claim amendments

The claims have been amended in order to make the distinction from the prior art more explicit. The main features are disclosed in the description as follows:

claim 1	forwarding of messages from producing clients via client managers and message managers to consuming client	page 6, line 22 to page 7, line 6
claim 1, 2, 3, 7, 13, 20	the destination is one of a topic or a queue	page 7, lines 7-9

New claim 21 has been added.

Arguments

Claim 1

Regarding the field of the invention, Terry does not refer to a message system. Message systems as e.g. the Java Message System (page 7, lines 7-9; page 10, lines 19-23) are based on the use of queues or topics for exchanging messages between clients. The use of queues or topics is made explicit in claims 1, 2, 3, 7, 13 and 20, further differentiating them from the cited art, in particular the Terry and Theimer references.

The arguments given in the response to the first office action regarding the different field of invention therefore still hold. Briefly stated, the subject of the Terry patent is to keep a database consistent with replica databases, so that a client shall find the same data when connecting to a replica at a later time (col. 2, lines 10-25). Theimer is directed towards a specific update mechanism linking said replicated databases.

Furthermore, neither Terry nor Theimer disclose:

- the message system being configured to receive messages from message producing clients and to forward messages to message consuming clients,

- a client manager comprising means for forwarding messages received from message producing clients to message manager nodes, and means for forwarding messages received from message manager nodes to message consuming clients,
- where said messages comprise a destination information addressing a destination, said destination being at least one of a queue and a topic.

Regarding the use of a multicast communication channel, the Examiner asserts that the Terry reference suggests such a use. However, this is not the case:

First, Terry only discloses the use of a multicast communication between replica databases, as set forth in the previous response. The Examiner states that "Theimer improves on the Terry invention by applying multicasting to the communications between the session managers and the servers." (Page 9, lines 3-5 of the office action). Applicant respectfully maintains that this is not the case, as shown by the relevant quotes from Theimer (emphasis added):

The present invention is directed to applications and/or systems which require weakly-consistent, replicated data storage in order to enable continued operation of component subsets in the face of faults and network partitioning events. More particularly, the invention is directed to propagating updates from an originating replica to all other replicas in an efficient manner. (col. 1, lines 8-14.)

A multi-node computer network is provided having a weakly consistent replicated data storage system with an enhanced update mechanism which enables continued operation of network subsets in the face of faults and network partitioning events. Provided is a multicast communication update facility configured to propagate updates from an originating replica source in the computer network to all replicas of the computer network at a single time using a best-efforts design. (col. 2, lines 58-66.)

The propagation to the replicas is shown in e.g. Figs.1 and 2 with reference numerals 28 and 30 (col. 4, lines 20-22). Figure 6 also shows the "multicast updates 76" between servers (col. 11, lines 13-14).

Thus, multicast communication takes place only between similar objects (the different replica databases), and never between databases and session managers.

In contrast to this, the claimed invention uses multicast communications between different types of subsystems (communication managers and message managers). The first type of communication may be unreliable (as stated in Theimer, col. 7, lines 35-40; col. 8, lines 5-8), whereas the second must provide guaranteed reliability (as required by the claimed invention), because it is not acceptable that messages get lost.

Furthermore, the session managers described in Terry and Theimer (e.g. Theimer, col. 4, line 66 – col. 5, line 10) serve to maintain the consistency over a set of separate read/write

operations to the databases. The use of multicast communication simply does not make sense for this purpose. Among others, this is because said read/write operations involve the selection and enforcement of guarantees (Terry, col. 6, lines 54-66), which involves reliable two-way communication and which is not feasible with an one-way, unreliable multicast connection.

Second, Theimer explicitly teaches away from the use of a multicast communications channel between clients and servers (Figures 1, 4, 5, 6, 7):

A client will tend to write to or read from primarily just one server when the system is functioning normally, and the client will switch over to another server ... when its primary server is for any reason unavailable (col. 3, lines 58-67).

Thus, Theimer describes the use of single point-to-point connections between clients and servers. This makes sense, since the clients may be mobile (col. 2, line 21), and any undue burden on the mobile connection should be avoided.

The communication between session managers and servers (Fig. 2) is also only point to point, in the form of read/write operations.

The advantages of multicast communication cited by the Examiner (low load on sender etc., page 9, second paragraph) make sense only when comparing multicast to the sending of a multitude of messages from one sender to a multitude of recipients. However, when only a single message (or single read/write request) is to be sent, as in Theimer, then there is no motivation to introduce multicast communication at all. In this context, multicast replacing a single point-to-point connection only complicates things unnecessarily.

Claim 2

None of the cited references discloses a message manager comprising computer program code means for receiving message data comprising destination information matching a destination of the message manager, and for maintaining said destination, said destination being at least one of a queue and a topic.

Claim 3

None of the cited references discloses a message manager comprising data storage means for storing message data in at least one of a queue and a topic.

Claim 6

Since none of the cited references discloses the use of destinations being topics or queues, as defined in claim 1 on which claim 6 depends, neither are:

nodes ... configured to contain identical destinations to maintain one or more

identical, redundant copies of stored data

disclosed. Furthermore, since according to Theimer multicast transmission takes place only between databases, it is not disclosed that the redundant copies of stored data are:

received in the same multicast transmission from a client manager as the original copy of stored data.

Claim 7

Terry discloses databases being accessed by read and write operations. Presumably, these operations involve some kind of address or identifier specifying where the data to be read or written is located. However, there is no suggestion that the destination is a topic or a queue and that, consequently, destination information contained in the message specifies a topic or a queue. Neither it is suggested that a multicast message is received by all message managers maintaining the same destination (i.e. topic or queue), since Theimer explicitly states that messages are sent to only one server or another, and are only afterwards distributed from server to server via replication (col. 1, lines 8-14; col. 2, lines 58-66; col. 3, lines 58-67).

Claim 8, claim 17

The Examiner did not point out which passages of the cited references are supposed to be relevant to claim 8.

According to the well-known publish/subscribe paradigm of message systems, a subscription comprises information about which client is interested in a given specific topic. The client information is maintained in the message manager, as stated in claim 8. (For details about subscription to topics and in particular wildcard subscription, see page 41, line 21 to page 42, line 13 of the application.)

Thus, message managers comprise information about clients, and know where to send the messages stored in the message managers. In contrast to this, the Terry and Theimer databases do not comprise information about clients and how and when to send data to the clients. Data is only returned to a client when the client issues a read command.

The invention therefore allows to provide messages to a client even at times when the client does not actively request a message.

Claim 9

The passages in Theimer cited by the Examiner as regarding claim 9 describe:

- a client switching from a primary server to another server when the primary server becomes unavailable (col. 3, lines 58-67).

- a general description of multicasting, in particular multicast groups.

This might suggest that several servers belong to the same multicast group. However, Theimer states that it is the client who selects the server to connect to, dependent on availability of the servers. A server, when accessed by a read/write request from a client, automatically responds to the request. The server does not care about the other servers or their availability.

According to the claimed invention, as claimed in claim 9, the message managers regularly control each other's operation. A backup message manager sends messages only if its primary message manager fails to function. This allows to react to failures without the client even noticing. This is neither suggested nor disclosed by the cited references.

Claims 10-12, claims 14-16, claims 18-19

The features of each of these claims are neither suggested nor disclosed by the cited references.

Claim 13

For the features analogous to those of claim 7 or 1, see the above argumentation.

Claim 13 further comprises the feature that the computer program product comprises computer readable code means for enabling the computer:

to transmit, depending on the content of said message data, a message to the message client addressed by said message data.

Thus, according to the invention a message client is addressed by message data. That is, the message specifies to which client it is to be sent. In contrast, Terry and Theimer disclose database requests being performed by clients. The data held in the database does not hold any information about where it will have to go. The data is only returned to a client that requests the data.

Claim 20

In addition to the novel and inventive features discussed regarding claim 1, claim 20 states that the message client library is written in the Java language and conforming to the Java Message Service API. Neither message systems in general, nor the use of the Java Message Service API are disclosed or suggested in the cited references.

Claim 21

New claim 21 has been added, combining a number of features from the system claims and making explicit some features that only were implied so far.

Reconsideration and allowance are respectfully requested.

Respectfully submitted,



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